REMARKS

Applicants respectfully request that the foregoing amendments be made prior to examination of the present application.

Claims 19, 31, 32, 33, and 34 have previously been cancelled.

Claims 1, 13, 17, 21, 23, 24, 28, 29, 35, 37, 38 and 41 are currently being amended.

Claims 42, 43, 44, and 45 are being added.

This amendment adds, changes and deletes claims in this application. A detailed listing of all claims that are, or were, in the application, irrespective of whether the claim(s) remain under examination in the application, is presented, with an appropriate defined status identifier.

After amending the claims as set forth above, claims 1-18, 20-30 and 35-45 are now pending in this application.

Applicants have amended the claims herein to more succinctly claim their invention and to obtain a speedier allowance of this application into an issued patent. Applicants reserve their right to file additional claims in a divisional, continuation, or continuation-in-part application directed to other subject matter.

Response to 35 U.S.C. § 112 Rejections

The Office Action dated February 23, 2005, has rejected claims 17-20 and 28-41 under 35 U.S.C. § 112, ¶ 1, as failing to comply with the written description requirement for failing to disclose "3 wt.% dimethylbutane." Applicants believe that the foregoing amendments have mooted this rejection, and request that the referenced claims be allowed over this rejection.

The Office Action also rejected claims 17-20 and 28-41 under 35 U.S.C. § 112, ¶ 2, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention. The Office Action only refers to the claim

language of claim 17 as being problematic. Applicants believe that the foregoing amendment to claim 17 have mooted this rejection. Specifically, n-hexane is a component of the 99 wt.% saturated aliphatic hydrocarbon having 6 carbon atoms that forms, in part, the isohexane solvent of claim 17. Applicants further believe that claim 28-41 are allowable for the same reasons. Accordingly, Applicants request that the referenced claims be allowed over this rejection.

Response to 35 U.S.C. § 102(b) Rejection

The Office Action has rejected claims 1-6, 8-10, 12, and 14 under 35 U.S.C. § 102(b) as being anticipated by Crawford et al. (U.S. Patent No. 2,596,010). The Office Action states that Crawford discloses using an isohexane solvent to form an extraction mixture, where the isohexane solvent includes 95% methylpentane (either 2- or 3-methylpentane) and less than 0.5% of aromatic. (Page 3). The Office Action notes that Crawford **does not** disclose any wet dew point or bubble point temperatures. (Page 4)

The rejected claims, as amended, are not anticipated by Crawford. The PTO acknowledges the legal standard that a "claim is anticipated only if **each and every element** as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." Verdegaal Bros. v. Union Oil Co. of California, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). Further, the "**identical invention must be shown in as complete detail as is contained in the ... claim.**" Richardson v. Suzuki Motor Co., 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989). See MPEP § 2131. The process of claim 1, as amended, requires an isohexane solvent that has (1) hydrocarbons having less than 6 carbon atoms in an amount of no more than about 0.1 wt.%, (2) n-hexane in an amount of less than 1 wt. %, and (3) a wet dew point temperature at 325 mmHg of at least 97°F. Crawford fails to disclose these limitations.

A. Crawford Fails to Disclose the Claimed Mixture and Amounts of Components.

Crawford does not disclose a mixture of components with the amounts as described in claim 1. Indeed, Crawford discloses a solvent with the claimed components far in excess of

that of claim 1: (1) hydrocarbons having less than 6 carbon atoms in an amount of 2.7 wt. % (*see* cyclopentane content of Table III of Crawford), and (2) n-hexane in an amount of 6.6% (*see* Table III of Crawford). Although Crawford may disclose a general solvent that includes a broad range of 2- and 3-methylpentanes, it does not teach the specific species of claim 1.

To the extent the Office Action suggests that the claimed amounts of the isohexane solvent components are described in Col. 2, lines 44-50 of Crawford, this is an improper reading of Crawford. This section of Crawford is ambiguous, at best. First, this section should be read to mean that these "other isoparaffin fractions" actually replace the methylpentane solvent entirely. Under this reading, the limitation of claim 1 would certainly not be met as the combination of components of isohexane of claim 1 is not shown.

Second, in an alternative reading of Crawford, this section may generally stand for the proposition that "other isoparaffin fractions" in an amount between 40% and 0% may make up the remainder of 40-100% methylpentane solvent. However, even with this reading, Crawford does not disclose:

(a) that the "other isoparaffin fractions" are combined,

(b) what, if any, combination of those fractions would be desirable or necessary to achieve the wet dew point of claim 1,

(c) the claimed amounts of hexane and hydrocarbons having less than 6 carbon atoms; and

(d) a solvent having at least the three components of the isohexane solvent of claim 1, namely methylpentane, hexane, and hydrocarbons having less than 6 carbon atoms.

Either reading of Crawford results in the same conclusion, Crawford is an inappropriate 102(b) reference because it fails to disclose the claimed species. For a reference to anticipate a species, the reference must permit a reader to "at once envisage" the claimed compound. In re Meyer, 599 F.2d 1026, 202 USPQ 175 (CCPA 1979) (A reference disclosing "alkaline chlorine or bromine solution" embraces a large number of species that cannot be said to anticipate claims to "alkali metal hypochlorite."); Akzo N.V. v.

International Trade Comm'n, 808 F.2d 1471, 1 USPQ2d 1241 (Fed. Cir. 1986) (Claims to a process using a 98% solution of sulfuric acid were not anticipated by a reference which disclosed using sulfuric acid solution but which did not disclose using a 98% concentrated sulfuric acid solution); MPEP 2131.02 (8th Ed.). Crawford does not permit a reader to do so. Crawford does not describe the claimed species of solvent.

B. The Office Action Fails to Make a Prima Facie Showing of Anticipation Because it Did Not Show that Crawford Inherently Discloses the Wet Dew Point of Claim 1.

The Office Action makes clear that Crawford does not disclose the wet dew point limitation of claim 1. (Pages 4 and 5). The Office Action does not claim that the wet dew point of claim 1 is inherent in Crawford, but suggests that the claimed wet dew point is obvious. The Office Action states that because "it would be expected that the isohexane solvent of Crawford is essentially the same as the claimed isohexane solvent . . . the isohexane solvent of Crawford would have a wet bubble point as claimed." This speculation cannot serve as a basis for a 102(b) rejection.

First, the Office Action acknowledges that the claimed isohexane solvent is different than that disclose in Crawford. The Office Action does not state, and cannot state, that the isohexane solvent of Crawford is the "same" as the isohexane solvent of claim 1. For the reasons shown above, they are clearly different. Instead, the Office Action states that the two solvents are "essentially the same" and are "similar." These are admissions that Crawford does not anticipate the invention of claim 1.

Second, the Office Action fails to meet the requirements of inherency. In cases where there is no express description of a claimed invention and the anticipation rejection is based on the doctrine of inherency, MPEP § 2112 sets forth the following basic principles that govern PTO practice:

(1) The fact that a certain result or characteristic **may** occur or be present in the prior art is **not sufficient** to establish the inherency of that result or characteristic. In re Rijckaert, 9 F.3d 1531, 1534, 28 USPQ2d 1955, 1957 (Fed. Cir. 1993).

(2) "To establish inherency, the extrinsic evidence 'must make clear that the missing descriptive matter is **necessarily present** in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. **Inherency, however, may not be established by probabilities or possibilities.** The mere fact that a certain thing **may result** from a given set of circumstances is **not sufficient**.'" In re Robertson, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999) (citations omitted).

(3) "In relying upon the theory of inherency, the **examiner must provide** a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic **necessarily flows** from the teachings of the applied prior art." Ex parte Levy, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Inter. 1990) (emphasis in original).

The Office Action has not shown that the wet dew point limitation of claim 1 "necessarily flows" from the solvents described in Crawford. Indeed, as shown in Table 2 of Applicants' specification and the accompanying Declaration of Matthew Turner, small changes in the amounts of the low weight hydrocarbons and dimethylbutane can drastically effect the wet dew point of the isohexane solvent. The unsupported observation in the Office Action that it is "**expected**" that the dew points of Crawford and claim 1 would be the same, despite only a "similarity" between the solvents, fails to appreciate the high degree of sensitivity to dew points temperatures borne out as a result of small changes in composition. This speculation does not meet the inherency standards of the Patent Office.

Crawford cannot inherently disclose the wet dew point of claim 1 because Crawford does not describe a specific solvent that has the claimed dew point. For these reasons, Crawford cannot anticipate claim 1. Further, Crawford cannot anticipate claims 2-6, 8-10, 12, and 14, which are dependent from claim 1.

Response to 35 U.S.C. § 103(a) Rejection

The Office Action has also rejected claims 7, 11, 13, 15-30, and 35-41 under 35 U.S.C. 103(a) as being unpatentable over Crawford. The Office Action bases this rejection on the same arguments in support of its 102(b) rejection of claim 1 and its various dependant

claims in combination with unsupported observations about the knowledge of what one of ordinary skill in the art would recognize.

The PTO acknowledges that in order to establish a prima facie case of obviousness, the following criteria must be met: (1) there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings, (2) there must be a reasonable expectation of success, and (3) the cited references must teach or suggest **all** the claim limitations. See MPEP § 2143. Furthermore, a prior art reference must be considered in its entirety, i.e., **as a whole**, including portions that would lead away from the claimed invention. See MPEP § 2141.02.

The Federal Circuit has explained that

> A critical step in analyzing the patentability of claims pursuant to section 103(a) is casting the mind back to the time of invention, to consider the thinking of one of ordinary skill in the art, guided only by the prior art references and the then-accepted wisdom in the field. Close adherence to this methodology is especially important in cases where the very ease with which the invention can be understood may prompt one "to fall victim to the insidious effect of a hindsight syndrome wherein that which only the invention taught is used against its teacher."
>
> Most if not all inventions arise from a combination of old elements. Thus, every element of a claimed invention may often be found in the prior art. However, identification in the prior art of each individual part claimed is insufficient to defeat patentability of the whole claimed invention. Rather to establish obviousness based on a combination of the elements disclosed in the prior art, there must be some motivation, suggestion or teaching of the desirability of making the specific combination that was made by the applicant.

In re Kotzab, 217 F.3d 1365, 1369-70 (Fed. Cir. 2000) (citations omitted). The Federal Circuit in Kotzab went on to require that "particular findings must be made as to the reason the skilled artisan, with no knowledge of the claimed invention, would have selected these components for combination in the manner claimed." Id. at 1371.

A. Crawford Fails to Disclose Every Limitation of Claims 17, 21, 24 and 35.

The "obviousness" rejection is improper because Crawford fails to disclose or suggest all of the elements of the claimed inventions. As shown above, Crawford does not disclose a process using the same combination of components, in the same amounts, as the claimed isohexane solvent of claims 1, 17, 21, and 35, and the claimed aliphatic hydrocarbon solvent of claim 24. Specifically, there is no teaching in Crawford of:

(1) using a solvent with the claimed percentage of methylpentane, n-hexane, and hydrocarbons having less than 6 carbon atoms of claims 1 and 24,

(2) using a solvent with the claimed percentage of methylpentane, n-hexane, 2,2-dimethylbutane, and hydrocarbons having less than 6 carbon atoms of claims 17 and 21, and

(3) using a solvent with the recited distillation characteristics and claimed percentage of hydrocarbons having less than 6 carbon atoms of claim 35.

The "obviousness" rejection is also improper because Crawford fails to disclose the wet dew point of the solvent of claim 1, the wet bubble point of the solvents of claims 17 and 24, and producing a vapor phase at a pressure P in mm and having the temperature range between X°F and Y°F of claim 35. These physical limitations on the claimed solvents are not shown expressly in Crawford. The Office Action fails to cite any identifiable source of information justifying that the Crawford reference discloses or suggests the claimed bubble points and temperature ranges. Instead, these conclusory statements appear to be "Official Notice" statements and the type of impermissible hindsight construction that is inadequate to support a prima facie case of obviousness without an affidavit from the Examiner as required by 37 C.F.R. 1.104(d)(2). Indeed, with respect to the limitations of claim 35, the Office Action fails to cite to any reference that includes the claimed temperature range.

Additionally, the Office Action has failed to make a prima facie case that these physical limitations are inherently shown in Crawford. As shown above, the Office Action has not shown that the bubble point and temperature range limitations "necessarily flow" from the solvents described in Crawford. The Office Action states that it is only "**expected**"

that the dew points of Crawford would be the same because the solvents are not exact, but are "**similar**." (Page 5). The Office Action fails to address the temperature range of claim 35 altogether. Again, this type of speculation does not meet the inherency standards of the Patent Office and cannot be used to render the claimed invention anticipated or obvious.

Because Crawford fails to disclose all of the limitations of amended independent claims 1, 17, 21, 24, and 35, these claims, and the claims dependant from them, cannot be obvious as a matter of law.

B. The Claimed Inventions Demonstrate Advantages That are Not Taught or Disclosed in Crawford.

A person skilled in the art would **not** have a reasonable expectation of success in arriving at the claimed inventions by following Crawford. See MPEP § 2143. Specifically, Applicants claim a new process for extracting oil by using a specific solvent that reduces the capital costs required to condense the vaporized solvent, which results in a more environmental-friendly process that prevents the solvent from being "blown-off" into the atmosphere. It is this specific solvent, as Applicants describe in claims 1, 17, 21, 24, and 35 that accomplishes these goals.

In support of this position, Applicants submit the Declaration of Matthew Turner. Mr. Turner is a skilled artisan of processes for oil extraction from seed materials using solvents and of the solvents themselves of which the Crawford patent relates. (Turner Dec., ¶ 6). It is Mr. Turner's opinion that: (1) Crawford fails to appreciate that small changes in the amounts and combinations of methylpentane, n-hexane, dimethylbutane, and hydrocarbons having less than 6 carbon atoms in a solvent mixture drastically effects the wet dew point of the solvent; and (2) others skilled in the art, after reading Crawford, would not appreciate that small changes in the amounts of various solvent components, and the specific blends of solvent components as amended herein, would have a significant effect on the cooling capacity required to condense the vaporized solvent. (Turner Dec., ¶ 8).

The benefits of Applicants' invention are described in the Turner Declaration at paragraphs 9-15 and Table 2 of Applicants' specification. Prior to Applicants' invention, an

oil extraction plant that changed its process to use commercially available isohexane (Solvent 1) in lieu of commercial n-hexane (Solvent 5) would require approximately **530%** of this cooling capacity to condense Solvent 1 as compared to commercial n-hexane. When the bubble point of the solvent nears the temperature of 95°F cooling water a temperature not uncommon in oil extraction processes during some times of the year), very small changes in wet bubble point temperatures dramatically affects the amount of cooling surface area required to condense the vaporized hydrocarbon solvent. Thus, the oil extraction plant would have to expend substantially more costs to condense the same amount of Solvent 1 over commercial n-hexane under the same conditions, or risk blow-off of the vaporized solvent into the atmosphere. (Turner Dec., ¶ 12).

Conversely, an oil-extraction plant using solvent compositions contemplated by the present inventions, including Solvents 2, 3 and 4 of Table 1 of the Turner Declaration and Table 2 of the specification, would require substantially less cooling capacity to condense the vaporized solvent and prevent release of the vaporized solvent into the atmosphere because:

- Solvent 2, which has only a **0.95°F change** in wet dew point temperature from Solvent 1, would require approximately **20% less** cooling capacity over Solvent 1;

- Solvent 3, which has only a **2.19°F change** in wet dew point temperature from Solvent 1, would require approximately **42% less** cooling capacity over Solvent 1, and

- Solvent 4, which has only a **2.98°F change** in wet dew point temperature from Solvent 1, would require approximately **50% less** cooling capacity over Solvent 1.

Thus, small changes in the composition of the solvents and wet bubble point temperature significantly affect the cooling capacity required to condense the solvents, which directly affects the costs associated with the oil-extraction process. (Turner Dec., ¶ 13). In particular, the solvents contemplated the presently claimed inventions provide significant improvement over existing solvents that contain some amount of n-hexane (e.g., Solvent 1)

due to the ratio of methylpentanes, dimethylbutanes, n-hexane, and hydrocarbons having less than 6 carbon atoms. The solvents of the presently claimed inventions also do not have the environmental problems commonly associated with solvents containing a large amount (>1.0%) of n-hexane (e.g., Solvent 5). The solvents of the presently claimed inventions also can be used more cost effectively than commercially available low n-hexane solvents (e.g., Solvent 1) because they do not require as much cooling capacity to condense the solvents to prevent blow-off into the environment. (Turner Dec., ¶ 14)

A skilled artisan, after reading Crawford, would not appreciate that small changes in the amounts of solvent components, and the specific blends of solvent components, would have such a significant effect on the cooling area required to condense the vaporized solvent. Although Crawford speaks generally of using a methylpentane blend, it fails to appreciate and disclose the impact of the other fractions of solvent used for oil extraction on the effect of the plant. (Turner Dec., ¶ 15). Accordingly, Crawford fails to suggest the claimed inventions and cannot be used to render obvious the inventions of claims 1, 17, 21, 24, and 35, or any claim dependant therefrom.

C. Crawford Teaches Away from the Claimed Inventions.

A reference should be considered as a whole, and portions arguing against or teaching away from the claimed invention must be considered. Bausch & Lomb, Inc. v. Barnes-Hind/Hydrocurve, Inc., 796 F.2d 443 (Fed. Cir. 1986). A references teaches away when it would lead a person of ordinary skill away in a direction divergent from the path that was taken by the applicant. In re Gurley, 27 F.3d 551 (Fed. Cir. 1994). Crawford cannot be used to render the claimed inventions obvious because it **teaches away** from using an isohexane with a low amount of hydrocarbons having less than 6 carbon atoms and/or a low amount of 2,2-dimethylbutane. (Turner Dec., ¶ 16).

In particular, Crawford discloses that the use of isopentane (a C5 hydrocarbon) "can be employed with excellent results." (Col 2, l. 50-Col. 3, l. 1). Crawford also discloses that using pure 2,2-dimethylbutane (neohexane), or alternatively, up to 40 wt.% 2,2-dimethylbutane (neohexane) "can be employed with excellent results." (Col 2, l. 50-Col. 3, l.

1). As shown above, in Turner Declaration Table 1 and Table 2 of the specification, such fractions would have a serious, deleterious effects by lowering the wet dew point temperatures which would (1) increase the required cooling capacity and, thereby, (2) increase the operational costs. (Turner Dec., ¶ 16). Applicants teach using as little of these hydrocarbon fractions as possible.

A skilled artisan, after reading Crawford, also would be **taught away** from using a small amount of n-hexane (<1.0%) in the solvent blend. (Turner Dec., ¶ 17). In Crawford, the methylpentane blend utilized contained a substantial amount of n-hexane, at least 6.6%. (Table III). This amount of n-hexane, which would significantly raise the wet bubble point and dew point of the solvent, is an impermissible level of n-hexane for modern commercial applications that require less than 1.0% n-hexane. (Turner Dec., ¶ 17).

Accordingly, Crawford cannot render obvious the claimed inventions. Applicants respectfully request that the Examiner allow all independent claims, and the claims dependent therefrom.

Applicants believe that the present application is now in condition for allowance. Favorable consideration of the application as amended is respectfully requested. The Examiner is invited to contact the undersigned by phone if it is believed that this would advance prosecution of this matter.

Respectfully submitted,

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